Attorney Docket Number: FSP0041
Title: SAFETY SHUTOFF FOR WATER HEATERS
Application Number: 10/729120

Claims

This listing of claims replaces all prior versions and listings of claims in the present application.

1. (Currently Amended) An apparatus comprising:
a solenoid lead;
a thermocouple to provide a first current source in a first direction to the solenoid lead; and
a sensor activated switch disposed to switch current from a second current source to the solenoid lead in a second direction different from the first[.]; and
a vapor sensor having a resistance that increases with vapor concentration, the vapor sensor deployed so that an increase to the vapor sensor resistance activates the switch.

2. (Original) The apparatus of claim 1, further comprising:
the sensor activated switch comprising a silicon controlled rectifier (SCR) to switch current from the second current source to the solenoid lead, the SCR selected so that the current from the second current source heats the SCR sufficiently to break a thermal fuse coupled to the SCR.

3. (Original) The apparatus of claim 1, further comprising:
a fusable link coupling the solenoid lead with the thermocouple and coupling the solenoid lead with the second current source.

4. (Original) The apparatus of claim 3, further comprising:
the fusible link comprising a thermal fuse thermally coupled to an element of the sensor activated switch.

5. (Original) The apparatus of claim 1, further comprising:
a sensor comprising a sensor impedance varying according to a presence of vapor, the sensor impedance electrically located to control the sensor activated switch.

6. (Original) The apparatus of claim 2, further comprising:
the second current source coupled to a gate of the SCR via a transistor.

7. (Currently Amended) A water heater comprising:
a gas valve;
a solenoid to operate the gas valve;
a thermocouple that, when heated by a pilot light, provides a first current source to maintain the gas valve in an open position; and
a sensor activated switch disposed to switch current from a second current source to the solenoid to move the gas valve to a closed position[.]; and
a vapor sensor having a resistance that increases with vapor concentration, the vapor sensor deployed so that an increase to the vapor sensor resistance activates the switch.

8. (Original) The water heater of claim 7, further comprising:
a fusable link coupling the solenoid with the thermocouple and coupling the solenoid with the second current source.

9. (Original) The water heater of claim 8, further comprising:
the fusible link comprising a thermal fuse thermally coupled to an element of the sensor activated switch.

10. (Original) The water heater of claim 7, further comprising:
the sensor activated switch comprising an SCR to switch current from the second current source to the solenoid, the SCR selected such that the current from the second current source heats the SCR sufficiently to break a thermal fuse thermally coupled to the SCR.

11. (Original) The water heater of claim 10, further comprising:
the second current source coupled to a gate of the SCR via a transistor.

12. (Original) The water heater of claim 7, further comprising:
a sensor comprising a sensor impedance that varies according to a presence of vapor, the sensor impedance electrically located to control the sensor activated switch.

13. (Previously Presented) The apparatus of claim 1, further comprising:
the sensor activated switch comprising a thermally actuated circuit breaking device.

14. (Previously Presented) The water heater of claim 7, further comprising:
the sensor activated switch comprising a thermally actuated circuit breaking device.

15. (New) An apparatus comprising:
a solenoid lead;
a thermocouple to provide a first current source in a first direction to the solenoid lead;
a sensor activated switch disposed to switch current from a second current source to the solenoid lead in a second direction different from the first; and
a fusable link coupling the solenoid lead with the thermocouple and coupling the solenoid lead with the second current source.

16. (New) An apparatus comprising:
a solenoid lead;
a thermocouple to provide a first current source in a first direction to the solenoid lead;
a sensor activated switch disposed to switch current from a second current source to the solenoid lead in a second direction different from the first, the sensor activated switch comprising a thermally actuated circuit breaking device.